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***Lake Thunderbird TMDL Monitoring Plan Implementation:  
Sample Year (SY) 2019- August Report***

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**SY2019 Monthly Report**

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*Lake Thunderbird TMDL Monitoring Plan Implementation:*

*August 2019 Monitoring Report*

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Oklahoma Water Resources Board  
Water Quality Programs Division  
Monitoring and Assessment Section  
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## SUMMARY OF AUGUST WATER QUALITY SAMPLING

Sampling for August 2019 occurred on the twenty-sixth and was considered a base flow collection. Water samples were collected at nine locations, with the exclusion of LT-1 as a result of dry conditions. Discharge measurements were not collected due to average base flow water levels. Mesonet data shows 1.28 inches of precipitation occurring on the twenty-sixth, 2.71 inches of precipitation in the 72 hours prior to sampling, and 0.05 inches of precipitation in the 72 hours after the sampling event. The total rainfall amount in Norman for the month of August was 6.29 inches. All water level gauges were operational for the month, with the exception of LT-1 due to equipment malfunction.

## RESULTS

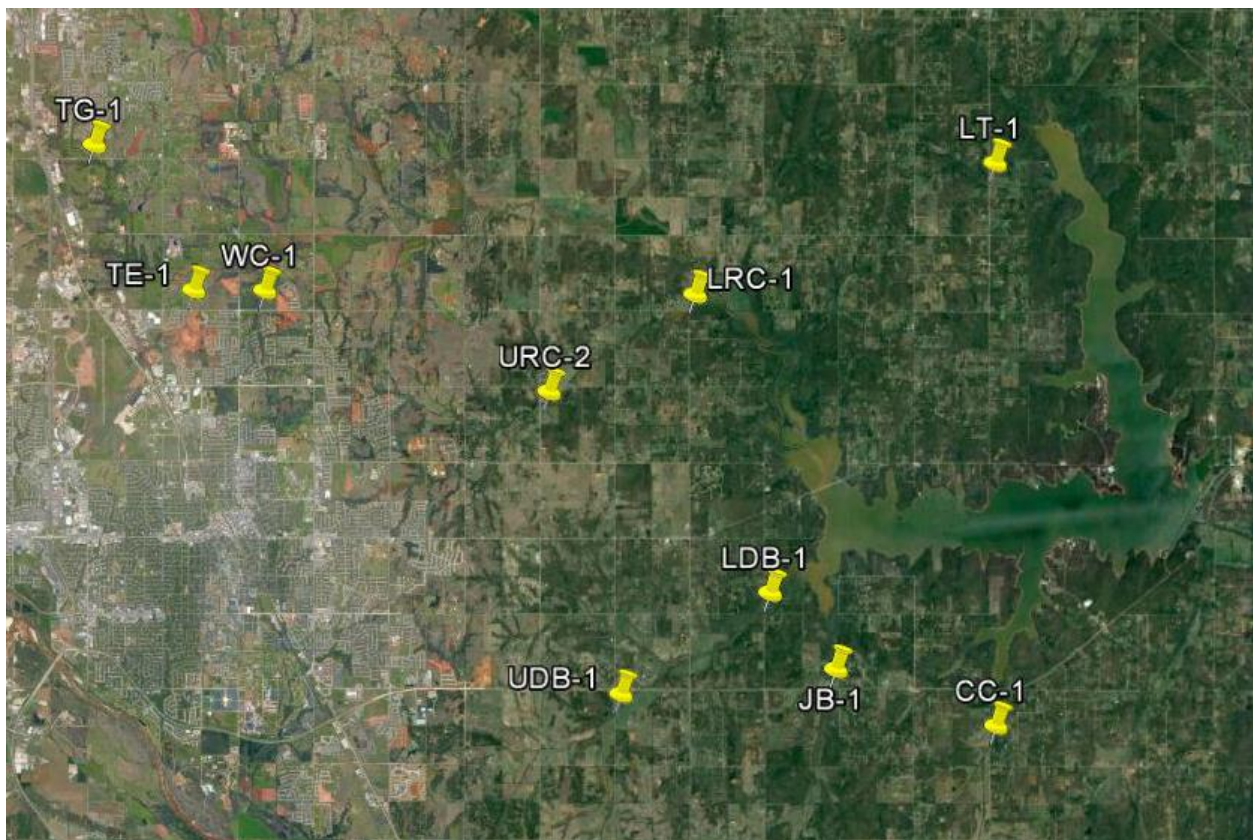


Figure 1 Monitoring Station Map

Monitoring Location ID	Monitoring Location Name	Date	Time	Field Crew	Water Temperature (°C)	Dissolved Oxygen (DO) (mg/l)	pH	Specific Conductance (mS/cm)	Turbidity (NTU)	Notes
CC-1	Clear Creek	08-26-2019	11:45	JW	28.2	8.96	8.20	648	7	
JB-1	Jim Blue Creek	08-26-2019	12:35	JW	26.9	4.38	7.62	614	29	
LDB-1	Lower Dave Blue Creek	08-26-2019	13:30	JW	26.0	1.58	7.85	428	55	
LRC-1	Lower Rock Creek	08-27-2019	11:40	JW	24.2	6.77	7.80	295	373	
LT-1	Lake Laterals	08-26-2019	15:00	JW	N/A	N/A	N/A	N/A	N/A	Completely dry
TE-1	Little River Tributary	08-27-2019	14:00	JW	24.3	6.83	7.87	270	91	
TG-1	Little River Tributary	08-27-2019	14:50	JW	25.2	7.18	8.07	358	153	
UDB-1	Upper Dave Blue Creek	08-26-2019	10:35	JW	24.5	4.69	7.64	440	35	
URC-2	Upper Rock Creek	08-27-2019	12:20	JW	24.1	6.09	7.88	258	310	
WC-1	Woodcrest Creek	08-27-2019	13:00	JW	24.9	7.66	8.26	242	46	

Table 1 Field Data Form

Monitoring Location ID	Monitoring Location Name	Nitrate and Nitrite (mg/l)	Kjeldahl Nitrogen (mg/l)	Phosphorus (mg/l)	Total Suspended Solids (mg/l)
CC-1	Clear Creek	0.18	0.40	0.089	6
JB-1	Jim Blue Creek	<0.05	2.39	0.314	20
LDB-1	Lower Dave Blue Creek	0.15	0.84	0.122	48
LRC-1	Lower Rock Creek	0.40	1.75	0.231	200
LT-1	Lake Laterals	N/A	N/A	N/A	N/A
TE-1	Little River Tributary	0.77	1.28	0.165	46
TG-1	Little River Tributary	0.30	1.09	0.188	38
UDB-1	Upper Dave Blue Creek	0.20	0.64	0.086	24
URC-2	Upper Rock Creek	0.52	1.58	0.230	112
WC-1	Woodcrest Creek	0.27	2.30	0.342	82

Table 2 Laboratory Analysis Summary

Monitoring Location Name	Nitrate and Nitrite (mg/l)	Kjeldahl Nitrogen (mg/l)	Phosphorus (mg/l)	Total Suspended Solids (mg/l)
Field Blank	<0.05	<0.10	<0.010	<5.0
Duplicate	0.18	0.42	0.090	6
Duplicate RPD	0%	4.88%	1.12%	0%

Table 3 QA/QC Data

Quality assurance/quality control (QA/QC) of the data includes a field blank and duplicate sample from each collection event, and is qualified by the OWRB. Relative Percent Difference (RPD) of the duplicate sample can be categorized into four levels, where Level 1 likely has no QA issues and Level 4 has major QA issues, and should be used with caution.

Monitoring Location ID	Monitoring Location Name	Discharge (cfs)	Stream Stage (ft)
CC-1	Clear Creek	0.88	20.42
JB-1	Jim Blue Creek	0.06	15.74
LDB-1	Lower Dave Blue Creek	1.91	15.89
LRC-1	Lower Rock Creek	19.63	18.73
LT-1	Lake Laterals	N/A	N/A
TE-1	Little River Tributary	0.49	11.79
TG-1	Little River Tributary	9.16	9.57
UDB-1	Upper Dave Blue Creek	0.12	17.4
URC-2	Upper Rock Creek	0.52	11.83
WC-1	Woodcrest Creek	0.13	8.31

Table 4 Station Discharge Summary

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

Utc Offs et: -06:00

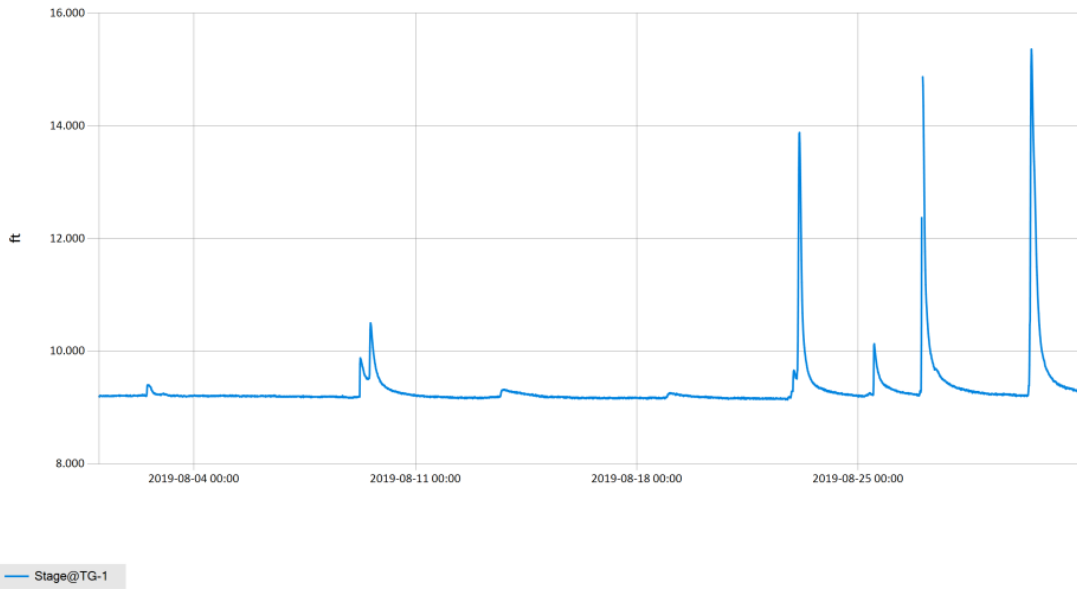


Figure 2 Monthly Hydrograph TG-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

Utc Offs et: -06:00

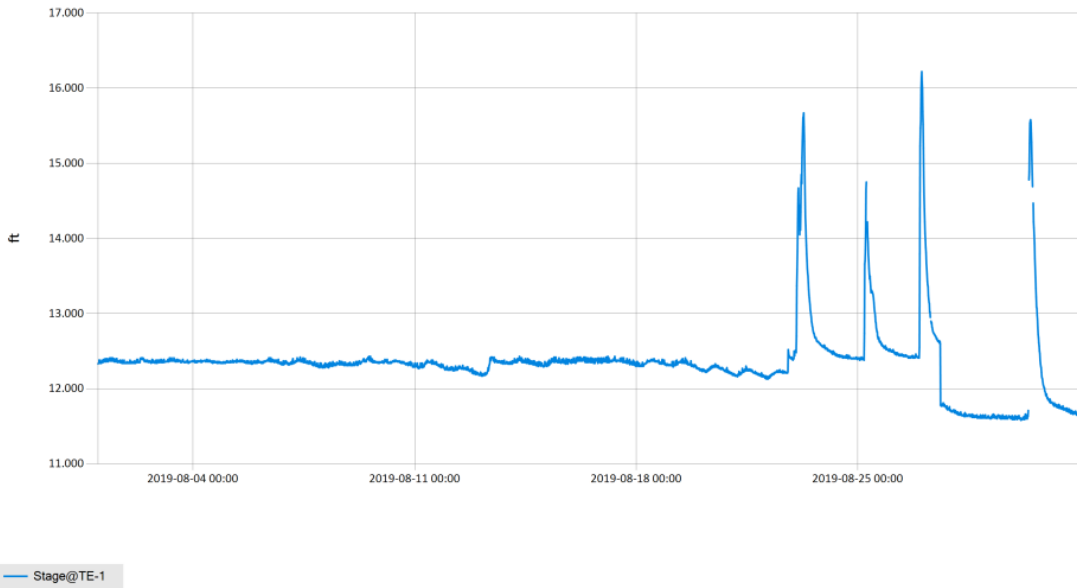
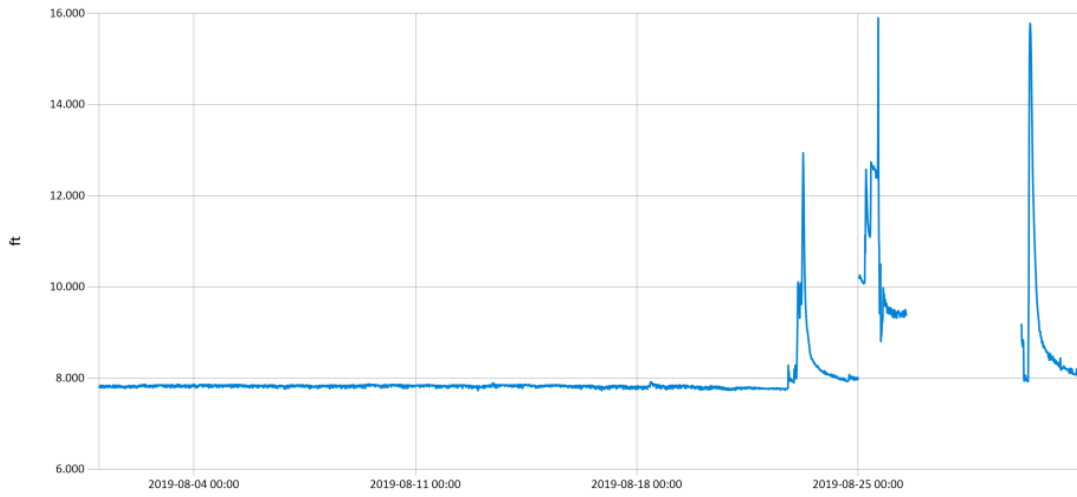


Figure 3 Monthly Hydrograph TE-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

UTC Offs et: -06:00

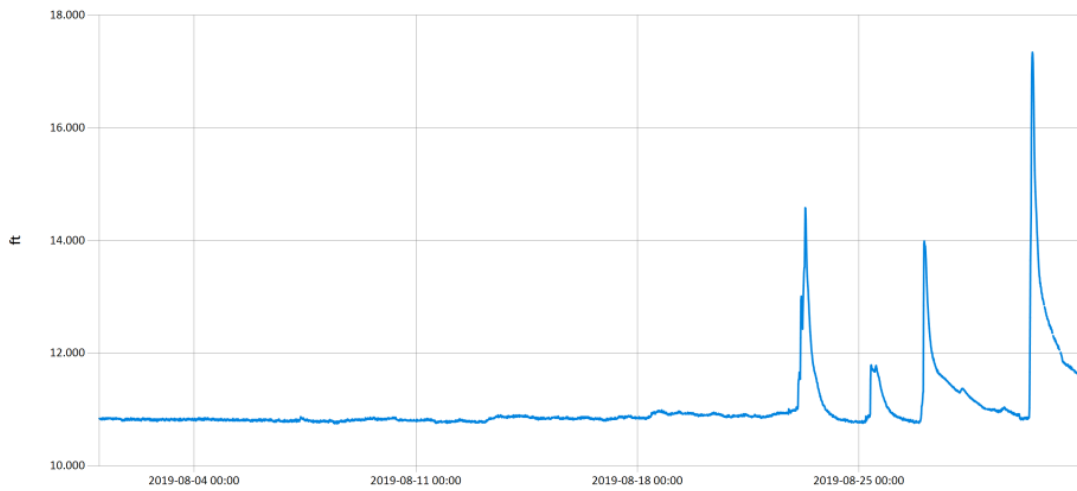


— Stage@WC-1

Figure 4 Monthly Hydrograph WC-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

UTC Offs et: -06:00



— Stage@URC-2

Figure 5 Monthly Hydrograph URC-2



Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

Utc Offs et: -06:00

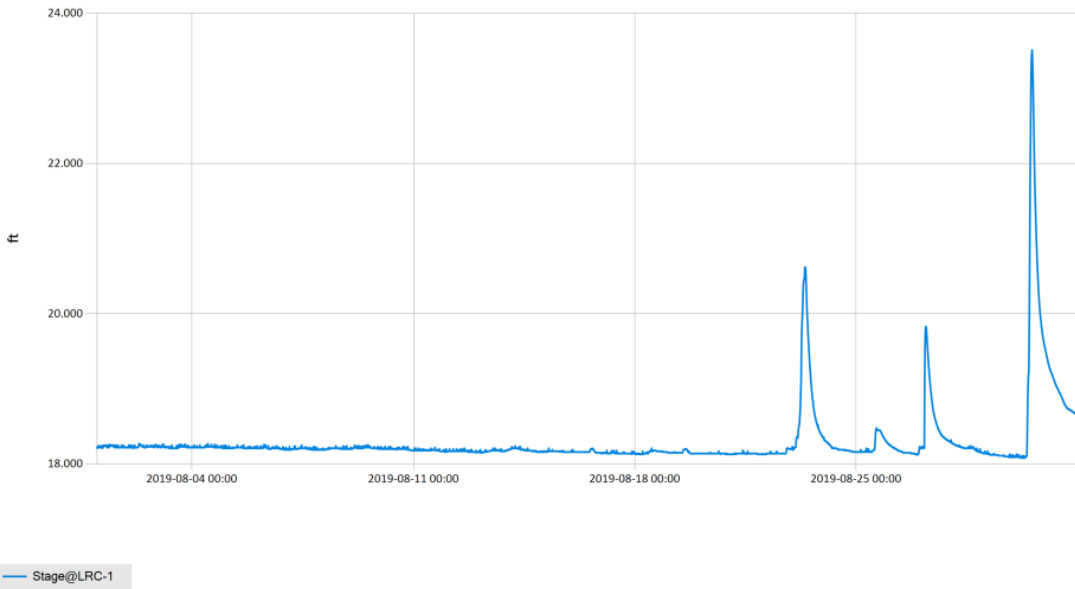


Figure 6 Monthly Hydrograph LRC-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

Utc Offs et: -06:00

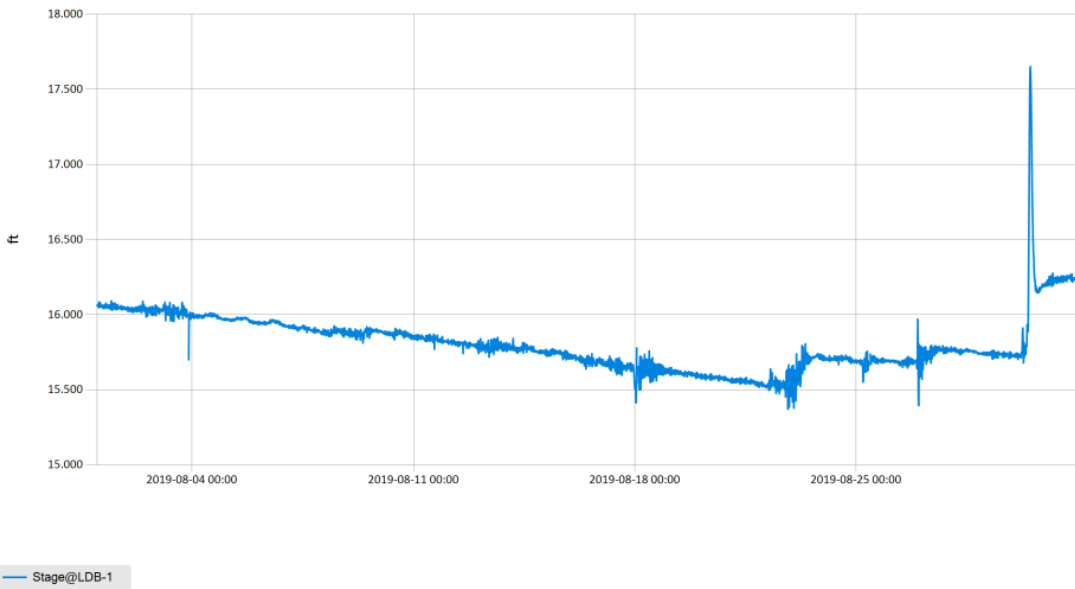


Figure 7 Monthly Hydrograph LDB-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

Utc Offs et: -06:00

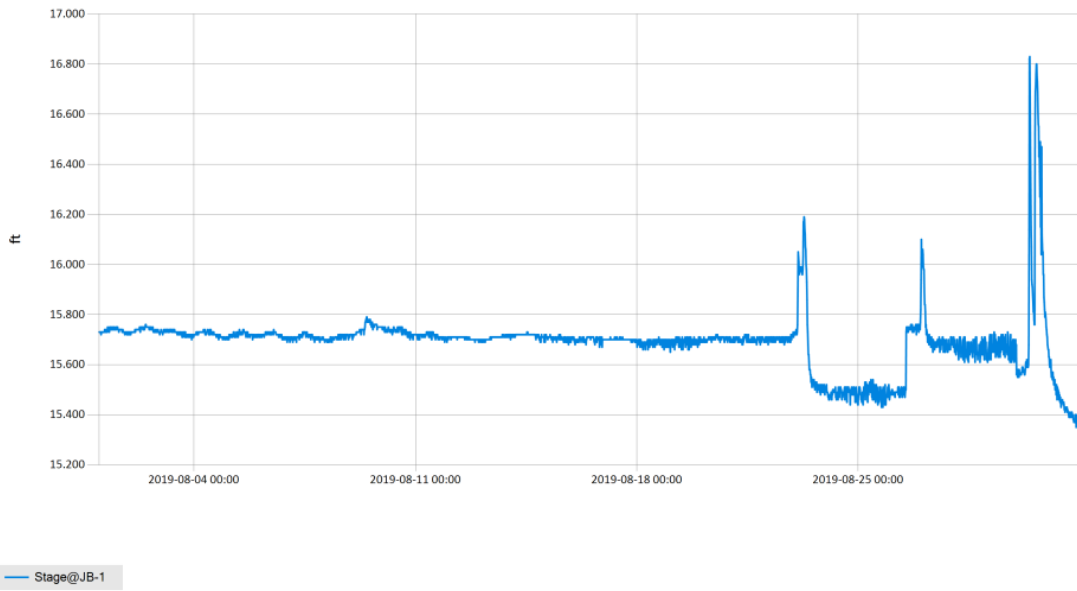


Figure 8 Monthly Hydrograph JB-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59

Utc Offs et: -06:00

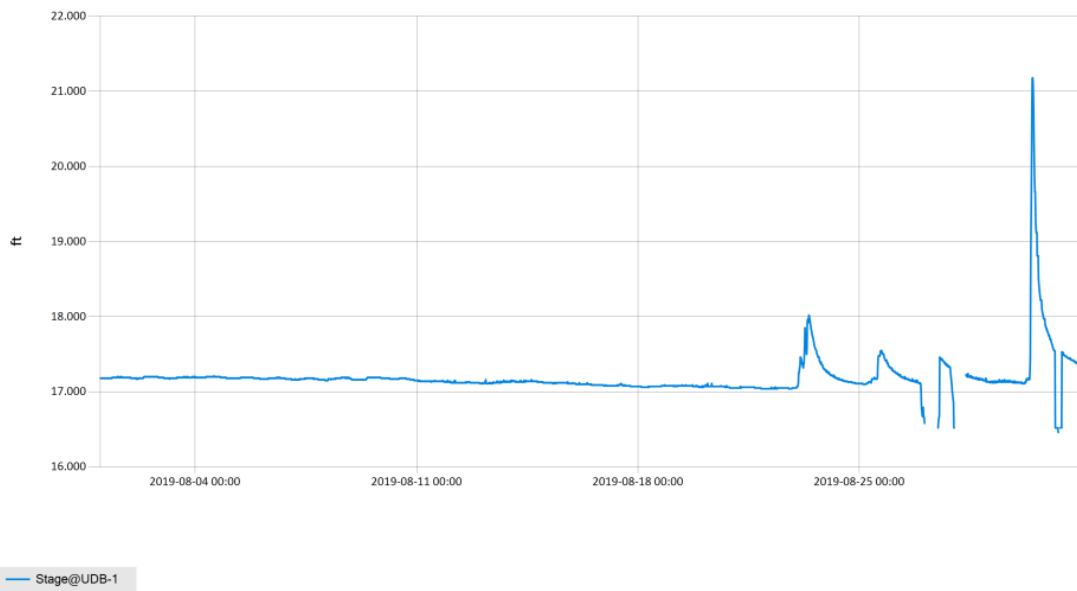


Figure 9 Monthly Hydrograph UDB-1

Period Selected: 2019-08-01 00:00 - 2019-08-31 23:59      Utc Offset: -06:00

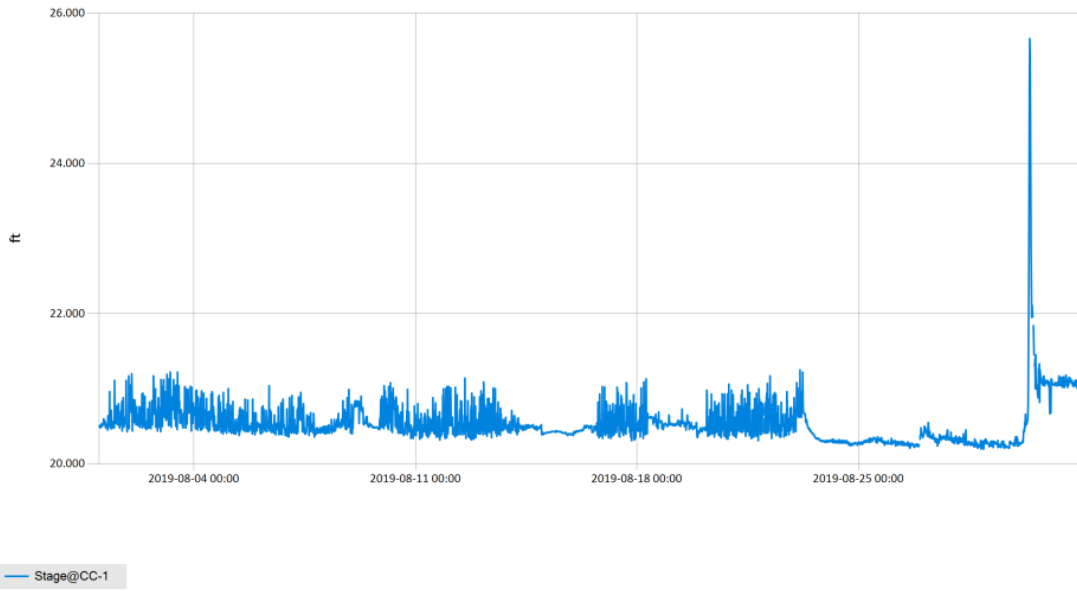


Figure 10 Monthly Hydrograph CC-1

MESONET CLIMATOLOGICAL DATA SUMMARY				August 2019				Time Zone: Midnight-Midnight CST												
(NRMN) Norman				Nearest City: 2.1 NW Norman				County: Cleveland												
Latitude: 35-14-09				Longitude: 97-27-53				Elevation: 1171 feet												
DAY	TEMPERATURE ( °F )				DEG DAYS		HUMIDITY (%)			RAIN (in)		PRESSURE (in)		WIND SPEED (mph)		SOLAR (MJ/m <sup>2</sup> )	4" SOIL TEMPERATURES			
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX		SOD	BARE	MAX	MIN
1	97	75	85.0	69.4	0	21	80	42	61	0.00	28.77	30.02	SSE	8.6	19.7	21.75	84.7	89.9	95	85
2	92	76	83.0	71.0	0	19	87	52	68	0.01	28.74	29.98	SSE	9.3	21.1	15.65	83.7	87.9	90	85
3	84	71	77.4	69.8	0	13	93	55	78	0.00	28.74	29.98	E	8.0	25.0	10.78	82.2	85.6	88	84
4	91	68	79.5	69.7	0	14	98	48	74	0.00	28.76	30.01	E	4.6	16.2	20.63	82.3	85.4	91	80
5	96	70	83.2	69.9	0	18	98	40	67	0.00	28.73	29.98	SE	4.2	16.2	23.26	83.6	88.0	94	82
6	99	77	87.6	69.5	0	23	85	34	58	0.00	28.69	29.93	S	5.8	30.4	22.42	85.2	90.2	95	85
7	102*	77*	89.8*	69.8*	0*	25*	82*	33*	55*	0.00*	28.63*	29.87*	S *	7.9*	19.7*	NA	86.3*	91.5*	98*	85*
8	92	78	82.9	72.3	0	20	91	53	71	0.00	28.65	29.90	S	7.8	18.3	12.26	85.3	89.0	93	86
9	91	75	80.1	75.1	0	18	96	59	86	0.12	28.68	29.93	E	7.6	25.5	14.87	84.3	86.1	90	83
10	103	76	88.1	71.0	0	25	95	31	62	0.00	28.66	29.90	SSE	7.1	17.3	22.81	84.2	88.3	96	82
11	102	78	89.5	69.0	0	25	78	33	53	0.00	28.67	29.92	S	9.1	22.4	25.47	85.1	91.0	98	84
12	104	77	90.1	67.4	0	25	77	27	50	0.00	28.62	29.87	S	9.1	22.8	26.49	85.9	91.7	99	85
13	87	74	80.0	69.2	0	16	95	51	71	0.11	28.74	29.98	NNE	6.4	20.6	12.45	84.7	87.7	92	85
14	93	68	82.0	68.5	0	16	91	42	66	0.00	28.81	30.06	E	6.2	22.1	24.84	84.0	87.7	96	81
15	97	69	84.3	67.4	0	18	93	35	60	0.00	28.75	29.99	SSE	6.4	19.7	24.37	84.2	89.2	96	82
16	99	76	87.7	68.0	0	23	75	35	54	0.00	28.65	29.89	SSE	10.9	24.7	25.77	85.0	90.1	97	84
17	101	74	88.1	69.4	0	23	81	37	56	0.02	28.58	29.82	S	11.4	44.9	24.70	86.3	90.9	97	85
18	98	75	84.1	71.4	0	21	95	43	67	0.07	28.61	29.85	SSE	10.3	30.5	19.09	84.5	87.7	92	84
19	101	78	88.7	70.4	0	25	76	35	57	0.00	28.70	29.95	SSE	8.4	20.0	25.09	85.7	89.8	97	83
20	101	77	88.9	68.9	0	24	78	33	54	0.00	28.75	30.00	SSE	7.4	19.8	24.38	86.9	91.2	98	85
21	101	74	88.0	67.1	0	22	83	29	53	0.00	28.72	29.96	SSE	7.0	19.5	25.28	87.4	91.7	99	85
22	94	71	80.2	68.4	0	18	97	41	69	0.61	28.68	29.93	E	7.5	28.4	17.84	86.5	89.6	96	86
23	88	69	76.5	68.5	0	13	98	46	79	2.04	28.71	29.95	E	9.2	27.5	20.74	80.6	81.9	86	78
24	89	70	77.2	70.7	0	15	97	55	82	0.00	28.71	29.95	SE	6.2	27.3	16.75	81.6	80.1	85	77
25	88	66	77.0	69.8	0	12	97	57	80	0.67	28.61	29.85	SE	8.0	37.4	19.26	80.6	78.8	83	75
26	98	69	83.9	73.3	0	18	95	47	73	1.28	28.50	29.74	SSE	10.8	51.0	24.21	82.2	81.2	87	76
27	79	70	73.9	69.4	0	10	96	75	86	0.05	28.76	30.00	NE	6.2	23.7	7.60	78.7	78.1	80	77
28	88	66	77.1	66.4	0	12	89	52	71	0.00	28.83	30.08	E	4.0	12.0	22.40	79.4	78.4	85	73
29	92*	74*	82.8*	72.7*	0*	18*	91*	56*	73*	0.00*	28.75*	30.00*	SSE*	8.1*	20.3*	NA	80.8*	80.4*	85*	76*
30	80	66	72.5	68.0	0	8	98	73	86	1.31	28.82	30.07	SSE	8.2	31.4	8.47	78.2	76.8	80	74
31	83	67	73.4	68.9	0	10	98	66	87	0.00	28.84	30.09	ENE	5.7	16.7	16.38	77.1	77.2	82	73
94* 73* 82.7* 69.7*				<- Monthly Averages ->				28.71* 29.95*		SSE* 7.7* 51.0*		19.86*		83.5* 86.2* 92* 81*						
Temperature - Highest: 104*					Degree Days - Total HDD: 0*					Number of Days With:										
Lowest: 66*					Total CDD: 566*					Tmax ≥ 90: 22*					Rainfall ≥ 0.01 inch: 11*					
Rainfall: Monthly Total: 6.29* in.					Humidity - Highest: 98*					Tmax ≤ 32: 0*					Rainfall ≥ 0.10 inch: 7*					
Greatest 24 Hr: 2.04* in.					Lowest: 27*					Tmin ≤ 32: 0*					Avg Wind Speed ≥ 10 mph: 4*					
										Tmin ≤ 0: 0*					Max Wind Speed ≥ 30 mph: 6*					

Figure 11 August Mesonet Data